

Introduction to Tickborne Diseases

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Overview of Tickborne Diseases

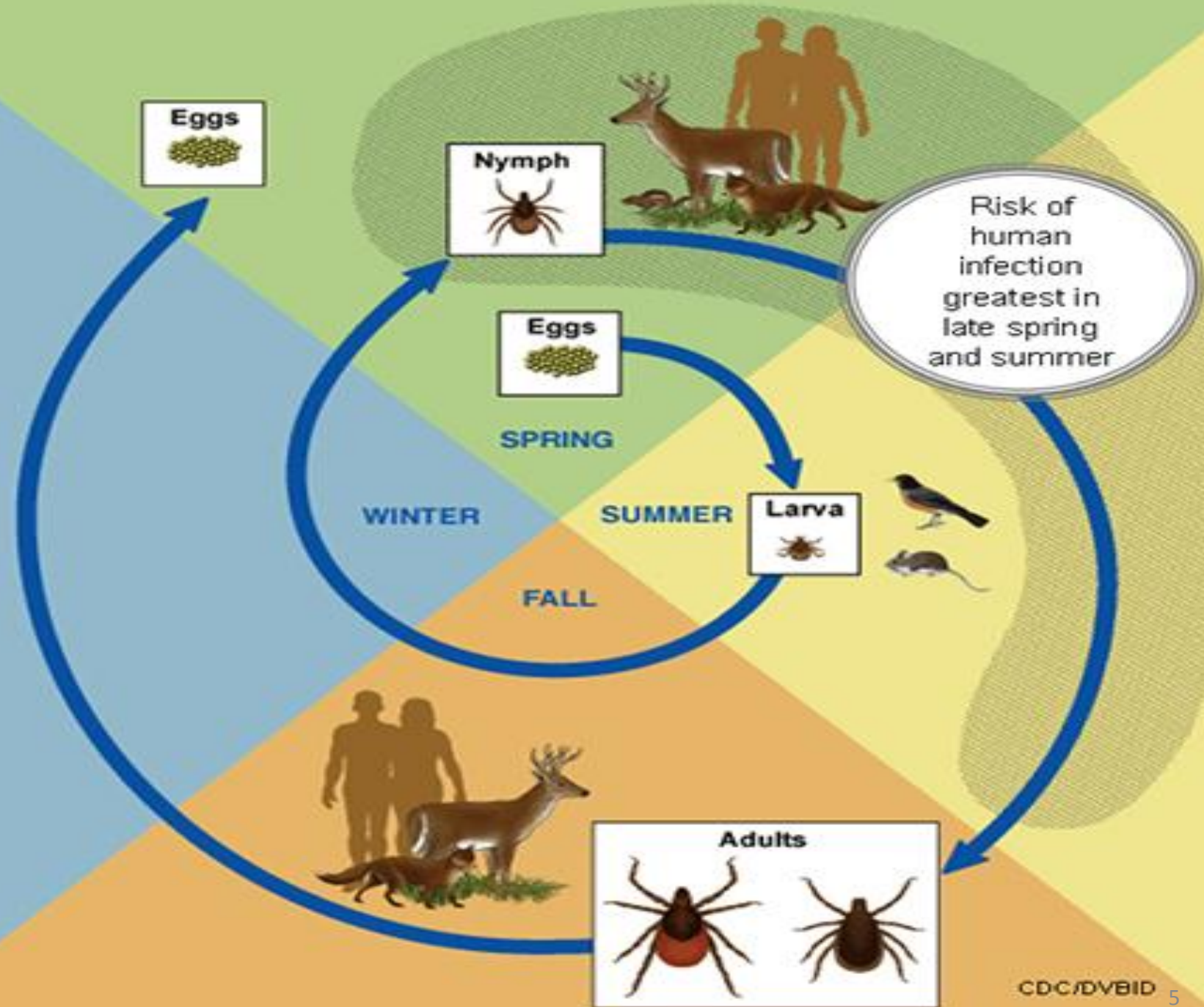
- **Introduction**
- **Lyme disease**
- **Tickborne rickettsial diseases**
- **Babesiosis**
- **Prevention of tickborne diseases**
- **Case ascertainment exercise**

Tickborne Diseases

- **Diseases spread by bites from infected ticks**
- **Can be caused by bacteria, viruses, and parasites**
- **Most infections occur in the spring and summer months**
- **Geographic distribution of tick species impacts location of human infections**

Tick Life Cycle

- **Hard ticks have four life stages**
 - **Egg**
 - **Six-legged larvae**
 - **Eight-legged nymph**
 - **Adult**
- **Most ticks prefer to feed on different hosts at each life stage**
- **Ticks can feed on mammals, birds, reptiles, and amphibians**



Symptoms of Tickborne Diseases

- Many diseases produce similar symptoms
- Asymptomatic or mild to life-threatening illness
- Most common symptoms
 - Fever/chills
 - Aches and pains
 - Rash
 - Proportion of people with rash varies among diseases
 - Distinctive rash appearance among diseases

Treatment of Tickborne Diseases

- **Supportive therapy**
- **Antibiotic therapy for bacterial tickborne diseases**
 - **Doxycycline commonly used**
 - **Duration of therapy varies by disease**

Diagnosis of Tickborne Diseases

- **Can be difficult to diagnose**
- **Clinical signs and symptoms**
- **Patient history**
 - **Tick bite or tick exposure**
- **Laboratory findings**
- **Diagnostic tests**
 - **Serology**
 - **Polymerase chain reaction (PCR)**
 - **Immunohistochemistry (IHC)**
 - **Culture**

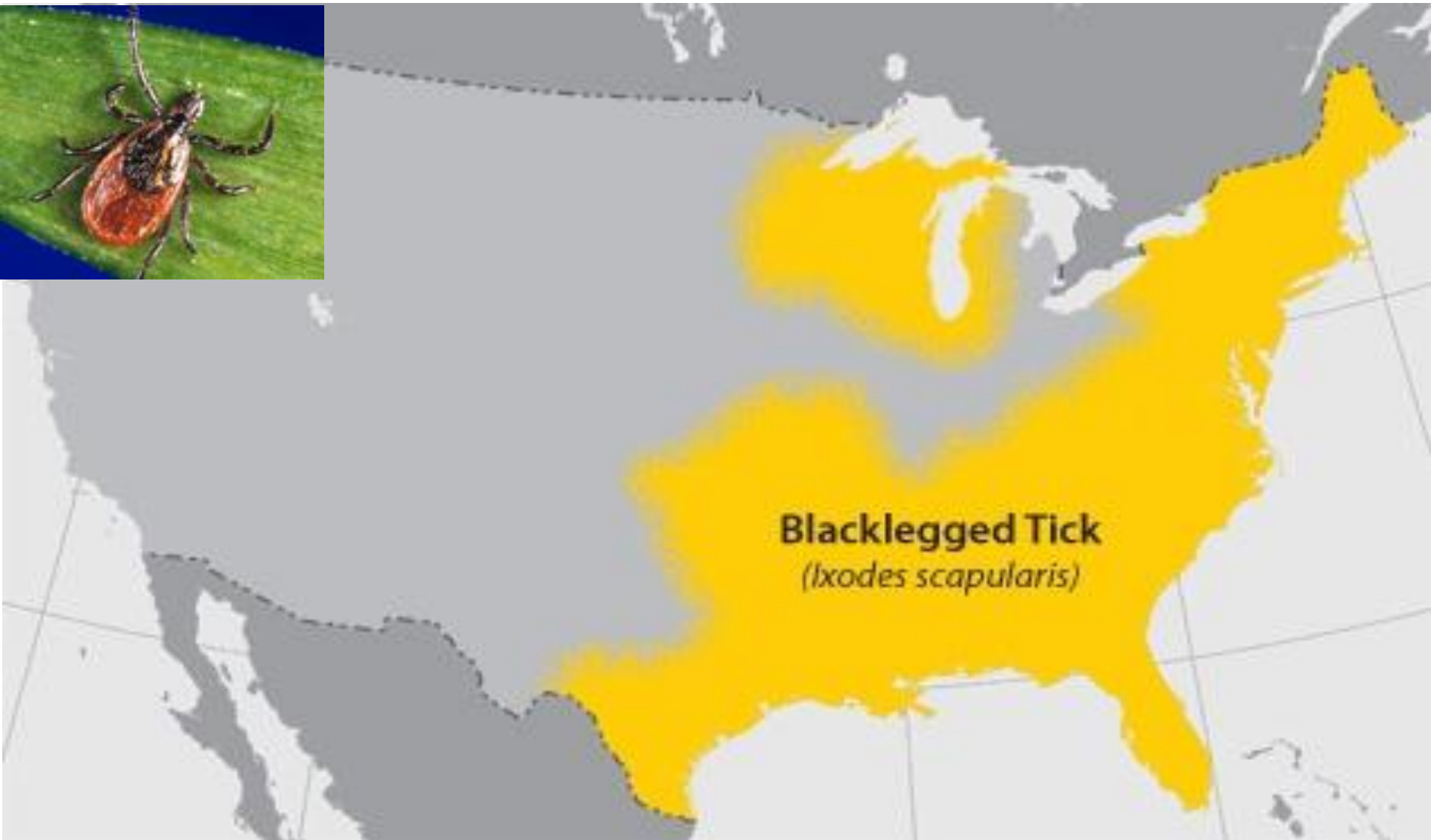
Tickborne Diseases in the United States

- **Lyme disease**
- **Rocky Mountain Spotted Fever**
- **Other Spotted Fevers**
- **Ehrlichiosis**
- **Anaplasmosis**
- **Babesiosis**
- **STARI**
- **Powassan**
- **Tularemia**
- **Others**

Lyme Disease

- **Most common tickborne disease in US**
- **Bacterial disease**
 - *Borrelia burgdorferi*
- **Transmitted by blacklegged tick and western blacklegged tick**

Geographic Distribution of Blacklegged Tick



Rocky Mountain Spotted Fever and Other Spotted Fevers

- **Bacterial diseases**
 - *Rickettsia rickettsii*
 - *Rickettsia parkeri*
 - *Rickettsia phillipi* (proposed)
- **Transmitted by American dog tick, Rocky Mountain wood tick, brown dog tick, Pacific coast tick, and Gulf coast tick**

Geographic Distribution of American Dog Tick



Geographic Distribution of Brown Dog Tick



Ehrlichiosis and Anaplasmosis

- **Bacterial diseases**
 - *Ehrlichia chaffeensis*
 - *Ehrlichia ewingii*
 - *Anaplasma phagocytophilum*
- **Transmitted by blacklegged tick, lone star tick, and western blacklegged tick**

Geographic Distribution of Lone Star Tick



Babesiosis

- **Caused by parasites that infect red blood cells**
 - **Species found to infect humans include *Babesia microti*, *B. divergens*, and *B. duncani***
- **Transmitted by blacklegged tick**
- **Less commonly congenital transmission and blood donor-associated cases have been identified**

STARI (Southern Tick Associated Rash Illness)

- **Cause is unknown**
- **Rash appearance similar to Lyme disease**
- **Has not been linked to arthritic, neurologic, or chronic symptoms**
- **Transmitted by lone star tick**
- **Most cases found in southeastern US**

Powassan

- **Arbovirus**
- **Causes encephalitis**
- **Most cases in northern US**
- **Transmitted by blacklegged tick and a related tick, *Ixodes cookei***

Tularemia

- **Less common tickborne disease**
- **Bacterial disease**
 - *Francisella tularensis*
- **Transmitted by American dog tick, lone star tick, and Rocky Mountain wood tick**
- **Other transmission routes include deer fly bites, inhalation, ingestion, skin contact with infected animals**
- **Cases found in every state except Hawaii**

Other Tickborne Diseases

- **Tickborne relapsing fever**
- **Colorado tick fever**
- **Tickborne diseases abroad**
 - **Tickborne encephalitis**
 - **Crimean-Congo hemorrhagic fever**

Summary

- **Numerous tickborne diseases can infect humans and cause disease**
- **Several tick species transmit tickborne diseases**
 - **Found in various geographic regions**
- **Symptoms can be similar among tickborne diseases**
- **Diagnosis can be difficult**

More Information to Come...

- **Lyme disease**
- **Tickborne Rickettsial diseases**
 - **Rocky Mountain Spotted Fever**
 - **Ehrlichiosis**
 - **Anaplasmosis**
- **Babesiosis**
- **Prevention of tickborne diseases**

Case Investigation Procedure

